



# WHY DOES FUNDING STATUS VARY AMONG STATE AND LOCAL PLANS?

By Alicia H. Munnell, Kelly Haverstick, and Jean-Pierre Aubry\*

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## INTRODUCTION

While state and local pensions as a group are about as well funded as plans in the private sector, significant variation exists. More than 60 percent are adequately funded, but almost 40 percent are not. Low levels of funding means that future taxpayers will have to pay the cost of unfunded pension promises, as well as the unfunded costs of retiree health insurance. Alternatively, if taxpayers balk at covering these pension commitments, future beneficiaries risk losing benefits, such as ad hoc cost-of-living increases.

This *brief* aims to sort out why some plans are less well funded than others. Section I looks at the variation in funding among the 109 state-administered and 17 locally-administered plans in the *Public Fund Survey* and finds a strong relationship between plan size and funding status. Thus, while a sizable number of plans are not well funded, three quarters of the

assets are in well-funded plans. Section II speculates about what factors — in addition to size — might affect funding levels. These factors fall into four categories — funding discipline, governance, plan characteristics, and the fiscal health of the state. Section III tests the importance of these factors on the funding of public pension plans using the *Public Fund Survey* and newly collected data.

The conclusion that emerges from this exercise is that the factors one would think important do indeed turn out to have a significant impact on funding status. Sponsors that are disciplined about their funding — have been at the funding effort for a long time, use a more rigorous actuarial cost method, and make their annual required contributions — have better funded plans. In terms of governance, plans with an independent investment council are better funded.

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Plan characteristics also matter: large plans are better funded; teacher plans, which generally have higher benefits, are less well funded. Finally, plans in states facing fiscal stress are less well funded.

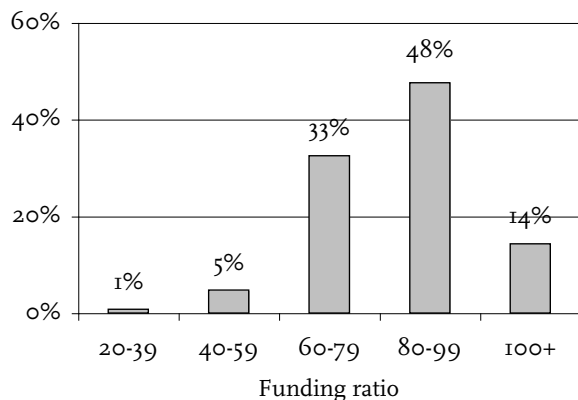
Identifying the factors that affect the ratio of assets to liabilities is only the first step in understanding the funding process. The key issue is whether the sponsor has a funding plan and is sticking to it. A future *brief* will explore the factors that affect the sponsor's decision to make annual required pension contributions.

## THE VARIATION IN FUNDING STATUS

A snapshot of a plan's funding status is provided by the ratio of assets to the actuarial accrued liability. The actuarial accrued liability is technically defined as the portion of the present value of all future benefits earned by current and past employees that is not covered by future "normal cost" payments, with future normal costs defined as the cost of pension benefits earned by current workers in future years. As discussed below, the value of the accrued liability depends on the actuarial cost method employed by the plan sponsor. But, the measure — at a minimum — generally captures benefits earned to date by current and past employees based on their projected salaries, so it is more than the liability the sponsor would face if the plan were terminated tomorrow.

Figure 1 shows the distribution of funding ratios for the sample of plans included in this analysis.<sup>1</sup> While over 60 percent of plans are at least 80 percent funded, many plans are not well funded.<sup>2</sup>

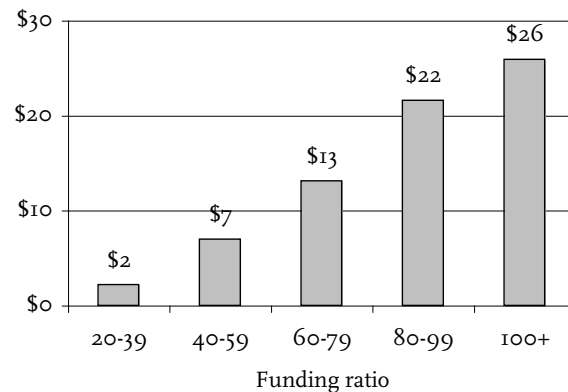
FIGURE 1. DISTRIBUTION OF STATE AND LOCAL PENSION PLANS, BY FUNDING RATIOS, 2006



Sources: Authors' calculations from National Association of State Retirement Administrators, *Public Fund Survey* (PFS), 2006 and various annual reports.

The potential fiscal impact of underfunding hinges on whether the plans with low funding ratios are big or small, so Figure 2 displays the average size of the plan by funding status. The funding status appears to have a direct relation to assets in the plan. The average assets in poorly funded plans were \$2 billion, compared to almost \$26 billion in fully funded plans.

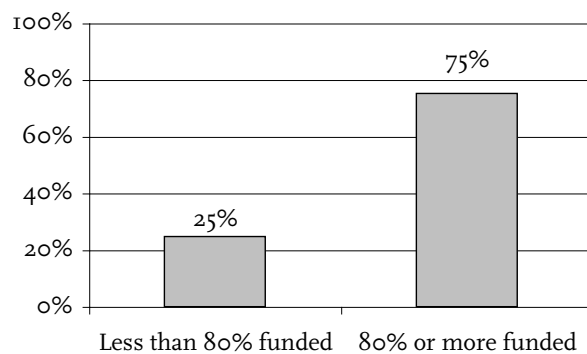
FIGURE 2. AVERAGE ASSETS OF STATE AND LOCAL PLANS BY FUNDING RATIO, BILLIONS, 2006



Sources: Authors' calculations from 2006 PFS and various annual reports.

As depicted in Figure 3, the distribution by asset size shows that three-quarters of the assets in our sample are in adequately funded plans (plans with a funding ratio of 80 percent or more). The question remains, however, as to what causes some governments to fund their plans and others not to.

FIGURE 3. DISTRIBUTION OF ASSETS, BY FUNDING STATUS, 2006



Sources: Authors' calculations from 2006 PFS and various annual reports.

## FACTORS THAT MIGHT AFFECT FUNDING STATUS

The factors affecting the funding status of plans fall into four categories: funding discipline, the governance of the plan, the characteristics of the plan, and the fiscal health of the state.<sup>3</sup>

### FUNDING DISCIPLINE

The funding status of pension plans depends on how long the government has been funding its pension costs, how much money the government and its employees are required to contribute, and whether the government has been making its annual required contributions.

*Length of funding effort.* The most obvious consideration is how long a plan has been on a funding regime. All else equal, a sponsor that has been making funding contributions for, say, ten years would be expected to have more assets than one just beginning such a program. Combining data on the standard funding period prescribed by Statement No. 25 of the Government Accounting Standards Board (GASB) and the years left to achieve full funding, both of which appear in the annual reports of public pension plans, it is possible to estimate how long the sponsor has been engaged in the funding effort.<sup>4</sup> A longer funding effort would be expected to lead to a higher ratio of assets to accrued liability.

*Actuarial method.* The choice of actuarial cost method may also have an impact on funding.<sup>5</sup> The majority of state and local plans in this sample (70 percent) use the entry age normal (EAN) method, about 13 percent use the projected unit credit (PUC) method, and the remainder uses other methods. Up to the point of retirement, the EAN method recognizes a larger accumulated pension obligation for active employees than the PUC method. Given comparable funding ratios, plans using the EAN method would have accumulated more assets than those using the PUC method. Therefore, the EAN method is a more stringent funding program. The question is how the choice of cost methods would affect the funding ratio. If plans start with no initial unfunded liability and are following their funding schedules, the choice of cost method should not matter — both would have a ratio of assets to liabilities of 100 percent. But our hypothesis is that

sponsors that opted for the currently cheaper funding regime — namely, the projected unit credit — may be less committed to funding their plans and therefore will have lower reported funding ratios.

*Making contributions.* The other consideration, regardless of the actuarial method selected, is whether sponsors are actually making the required contributions. GASB 27 defines the Annual Required Contribution (ARC) as the employer's share of the normal cost (the portion not covered by employee contributions) and any payment required to amortize an unfunded liability. Sponsors are required to report the percent of the ARC paid.<sup>6</sup> Sponsors with the discipline to make the required annual contributions should have plans that are better funded than those with less discipline. Some sponsors may have the discipline, but may fail to make their ARC due to statutory limitations on their contribution rate. In any case, regardless of the reason, a sponsor's failure to make its ARC will lead to lower funding.

### GOVERNANCE

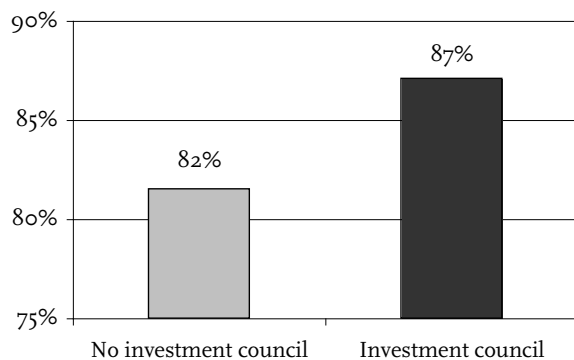
Several studies have explored the effect of governance on the funding status of public pension plans.<sup>7</sup> Based on this earlier research, two variables that seemingly would be expected to have an important effect on the funding status of pension plans are the presence of employees and/or retirees on the board that governs the plan and the existence of an investment council.

*Funding varies for a number of reasons.*

*Employees/retirees on the board.* Pension boards can influence a plan's actuarial method and its investment policy, which in turn could affect funding status. The composition of the board may be important. One view is that boards with a lot of workers and retirees could be more interested in benefit expansion or greater cost-of-living adjustments than in funding benefit promises, which could lead to less asset accumulation. Also, to the extent that plan beneficiaries are not financial experts, plan assets may not be well invested. An alternative view is that workers and retirees have more of a stake in the plan's success than outside board members and, therefore, their presence on a board would tend to have a positive impact on a plan's funding status. Earlier studies have shown mixed results.<sup>8</sup> In the following analysis, board composition is represented by the percent of board seats occupied by retirees and employees.

*Investment council.* The hypothesis with respect to an investment council is just the opposite. If a plan has a dedicated investment board or hires financial advisors in making its investment decision, the plan should have greater returns, more assets, and a higher funding ratio.<sup>9</sup> The variable included is a dummy variable indicating if the plan has a separate investment council that directly makes investment decisions. Figure 4 shows the mean funding ratio is higher for the plans that have an investment council than for those that do not have one.

FIGURE 4. MEAN FUNDING RATIO OF STATE AND LOCAL PENSION PLANS, BY PRESENCE OF INVESTMENT COUNCIL, 2006



Sources: Authors' calculations from 2006 PFS and various annual reports.

#### PLAN CHARACTERISTICS

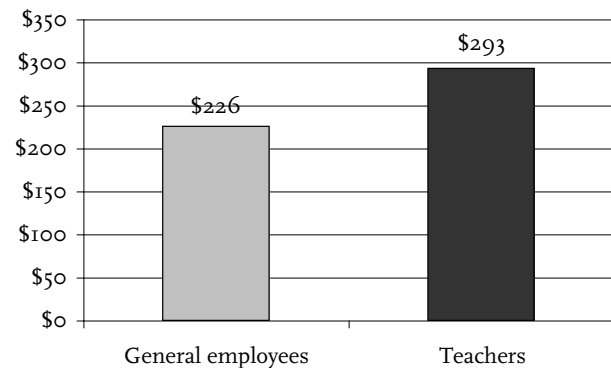
Three characteristics of the plan would be expected to affect the funding ratio — plan size, whether the plan is administered at the state or local level, and the generosity of benefits.

*Plan size.* As discussed earlier, plan size and funding levels appear to be closely related. Possible reasons for this pattern may be more sophisticated asset management, better discipline because not funding could have a huge impact on taxpayers in the future, or the effect of being more in the political spotlight than smaller plans. In any event, the assets of the plans are included as an explanatory variable, and their impact is expected to be positive.

*State administered.* Similarly, state-administered plans may have higher funding levels than locally-administered plans, independent of size, because they would have access to better management and would be subject to greater public scrutiny.

*Benefit levels.* The more expensive the plan, the more difficult it is to fund, simply because the annual required contributions will be higher. High initial benefits make a plan expensive, and substantial cost-of-living increases also raise overall costs. Not surprisingly, some previous studies have found a positive relationship between the level of benefits and low funding ratios.<sup>10</sup> One way of measuring generosity is to examine a plan's accrued benefits or liabilities. One study found that teachers have longer tenures than general government employees and higher earnings (due to higher education levels).<sup>11</sup> These factors translate into larger pension liabilities (see Figure 5). Thus, this analysis includes information on whether or not teachers are included in a plan, and their inclusion is expected to have a negative effect on funding.

FIGURE 5. LIABILITIES PER ACTIVE WORKER, BY PLAN TYPE, THOUSANDS, 2006



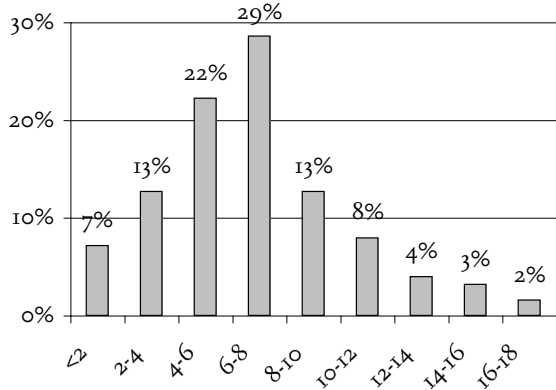
Note: Data only for states with a General Employee's Plan and a separate Teacher's Plan. General Employee plans may include police and fire employees.

Sources: Authors' calculations from 2006 PFS and various annual reports.

#### FISCAL SITUATION

The final factor that may influence funding is the fiscal health of the state. The notion here is that if a state is having fiscal problems, it may meet current non-pension obligations by not making the annual contribution to the pension plan.<sup>12</sup> Thus, plans in states facing fiscal distress are less likely to be well funded. The measure of fiscal distress in the following analysis is the ratio of a state's debt to its Gross State Product (GSP).<sup>13</sup> This measure varies significantly among the states (see Figure 6 on the next page), and is expected to have a negative impact on funding.

FIGURE 6. DISTRIBUTION OF STATE AND LOCAL PENSION PLANS, BY STATE DEBT AS A PERCENT OF GSP, 2005



Sources: Authors' calculations from Bureau of Economic Analysis, 2005 and U.S. Census Bureau, 2004-2005.

RESULTS

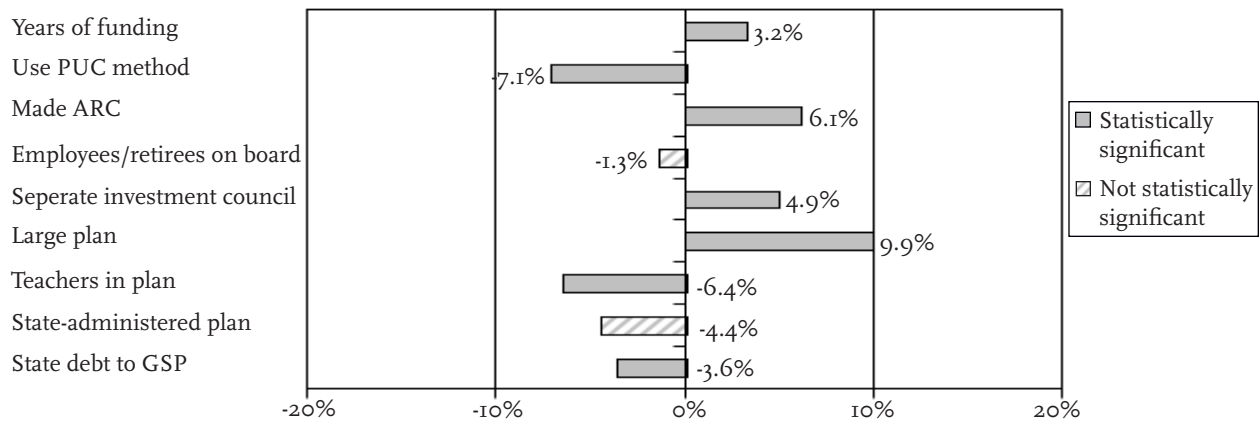
A regression equation was used to estimate the impact of each of the variables discussed above on the 2006 funding ratios for the 126 plans in our sample. The results of the regression are shown in Figure 7. All the variables except state administration have the expected effect on the funding status of the pension plan, and virtually all effects were statistically significant.

In terms of funding discipline, plans where funding has been going on for a long time and where the plan sponsor makes the annual required contribution (ARC) have higher levels of funding. For example, if the sponsor makes the ARC payment, the funding ratio is 6.1 percentage points higher than in situations where the full ARC is not paid. On the negative side, plans using the projected unit credit costing method have a funding ratio 7.1 percentage points lower than other plans, which rely primarily on entry age normal.

With regard to governance, having employees and/or retirees on the board does not appear to affect the level of funding, while having a separate investment council improves the funding status by 4.9 percentage points.

The characteristics of plans, except for state administration, also have the expected effects. Plans that include teachers have an average funding ratio that is 6.4 percentage points less than plans that do not cover teachers. And the largest third of plans do appear to have a scale advantage with an average funding ratio that is almost 10 percentage points higher than small and medium plans. The results also suggest that state administration has a negative effect on funding; however, the coefficient is only marginally significant. Moreover, our sample includes only 30 percent of the assets of plans administered at the local level compared to 90 percent of the assets in state-administered plans. Most locally administered plans not in our sample are small and lack a separate investment council, characteristics

FIGURE 7. EFFECT ON THE FUNDING RATIO OF STATE AND LOCAL PENSION PLANS, 2006



Note: The effect for the variables "Years of funding," "Employees/retirees on board," and "State debt to GSP" is for a one-standard-deviation change in the value.

Sources: Authors' calculations from 2006 PFS and various annual reports.

that would be expected to lead to lower funding levels. Thus, the results should not be interpreted as saying anything about the merits of state versus local administration.

Finally, the regression confirms that the fiscal health of the state plays an important role. States with high levels of debt to GSP are less well funded than those with lower levels. As discussed above, this fiscal ratio varies substantially (from 1.6 to 17.5 percent), and the results show that a one-standard-deviation change in the ratio reduces funding levels by about three and one-half percentage points.

## CONCLUSION

While the aggregate public pension systems seem to be in good health, funding ratios vary substantially among plans. Most pension plans are adequately funded, but many fall short of the generally accepted 80 percent funded level. This leads to the question of why some governments are more successful at funding their plans than others.

Some factors expected to affect the funding status of state and local pension plans include funding discipline, governance, general plan characteristics, and the overall fiscal health of the government. Indeed, variables in each of these categories are found to have significant impacts on plans' funding ratios.

Identifying the factors that affect the ratio of assets to liabilities is only the first step in understanding the funding process. The key issue is whether the sponsor has a funding plan and is sticking to it. A future *brief* will explore the factors that affect the sponsor's decision to make annual required pension contributions.

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# APPENDIX

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## APPENDIX. DATA AND METHODOLOGY

The sample includes data from the 2006 *Public Fund Survey* prepared by the National Association of State Retirement Administrators, augmented with data from annual reports. For ten plans — Connecticut SERS, Massachusetts SERS, Rhode Island ERS, Wisconsin WRS, Massachusetts Teachers, Minneapolis ERS, New York City Teachers, Ohio Police & Fire, Rhode Island Municipal, and University of California — all the data used in the regression come from annual or actuarial reports. Additionally, for all plans, the total years to amortize unfunded liability, the years remaining to amortize any unfunded liability, the percent of ARC paid, and having an investment council are also from the plans' annual or actuarial reports.<sup>14</sup> Any other plan data missing from the *Public Fund Survey* are also taken from annual or actuarial reports. The state debt is from the U.S. Census Bureau's *State and Local Government Finances: 2004-05*. Finally, the data for GSP is from the Bureau of Economic Analysis' 2005 *Gross Domestic Product by State*.<sup>15</sup> The summary statistics of these variables are listed in Table A1.

The regression is a linear regression on the ratio of assets to accrued liability in 2006. The regression estimates are shown in Table A2. One difference between these coefficients and the effects in the text is that for the three continuous variables, years of funding, employees/retirees on the board, and state debt as a percentage of GSP, the text shows the effect of a one-standard-deviation change in the variable (shown in Table A1) while Table A2 is the effect of a one-unit change in the variable.

TABLE A2. REGRESSION RESULTS ON THE FUNDING RATIO OF STATE AND LOCAL PENSION PLANS, 2006

Variable	Coefficient
Years of funding	0.004 *** (0.00)
Use PUC method	-0.071 ** (0.03)
Made ARC	0.061 *** (0.02)
Employees/retirees on board	-0.001 (0.00)
Seperate investment council	0.049 ** (0.02)
Large plan	0.099 *** (0.02)
Teachers in plan	-0.064 ** (0.02)
State-administered plan	-0.044 (0.03)
State debt to GSP	-0.011 *** (0.00)
Constant	0.916 *** (0.05)
R-squared	0.384
Number of observations	126

Note: Robust standard errors are in parentheses. Coefficients are significant at the one percent level (\*\*\*) or five percent level (\*\*).

Source: Authors' calculations.

TABLE A1. SUMMARY STATISTICS OF VARIABLES INCLUDED IN THE REGRESSION, 2006

Variable	Mean	Standard deviation	Median	Minimum	Maximum
Funding ratio	0.83	0.15	0.84	0.32	1.13
Years of funding	4.34	8.79	0	-10	30
Use PUC method	0.14	0.35	0	0	1
Made ARC	0.56	0.5	1	0	1
Employees/retirees on board	55.69	23.92	55.56	0	100
Seperate investment council	0.35	0.48	0	0	1
Large plan	0.33	0.47	0	0	1
Teachers in plan	0.47	0.5	0	0	1
State-administered plan	0.87	0.34	1	0	1
State debt to GSP	6.89	3.39	6.27	1.59	17.5

Source: Authors' calculations.

## ENDNOTES

- 1 The funding ratio used in this analysis is based on the actuarial value of assets and actuarial accrued liability for FY2006, except for the New York City Teachers' pension plan. The funding ratio for this plan is for FY2005, as FY2006 values of assets and liabilities were not available.
- 2 The U.S. GAO (2008) reports that many experts feel that plans that are currently at least 80 percent funded are healthy.
- 3 One might think that asset allocation might also be important, but the variable "percent in equities" was never statistically significant in any of the equations estimated for our analysis.
- 4 See Munnell et. al. (2008) for background on the reporting requirements for state and local plans and the potential impact that reporting may have had on funding levels.
- 5 See Winklevoss (1993) for a discussion of the various actuarial cost methods.
- 6 The variable used in our analysis is the percentage of the ARC paid in 2006. The few plans that use the aggregate cost method create something of a problem. This method defines normal cost as the amount needed to amortize the difference between the present value of future benefits and current assets. Thus, these plans contribute the amount needed to keep the plan fully funded each year. Such plans (Washington LEOFF Plan 1, Washington LEOFF Plan 2, Washington Teachers Plan 2/3, Washington PERS 2/3, and Washington School Employees Plan 2/3) were assigned a 100 percent of ARC paid for 2006. The regression was also run excluding these observations and produced similar results.
- 7 See Carmichael and Palacios (2003); Mitchell and Hsin (1997); Schneider and Damanpour (2002); and Yang and Mitchell (2005).
- 8 Romano (1993); Coronado, Engen, and Knight (2003); Munnell and Sundén (2001); Harper (2008); Yang and Mitchell (2005); and Hess (2005).
- 9 Previous studies have directly included a measure of the rate of return on investments (see Yang and Mitchell (2005)).
- 10 See Johnson (1997) and Yang and Mitchell (2005).
- 11 Weller, Price, and Margolis (2006).
- 12 The U.S. GAO (1993, 1985) provides examples of states that closed budget gaps by reducing the pension contribution while Chaney, Copley, and Stone (2002) and Bohn and Inman (1996) consider the general effects of balanced budget requirements in states. Since almost all states have some type of balanced budget requirement, this variable was not included in our analysis. Additionally, Mitchell and Smith (1994) used the state unemployment rate as a measure of the fiscal situation.
- 13 The concept of the debt to GSP is similar to the leverage variable used in Davis, Grob, and de Haan (2007) for private employers. This variable is for 2005, as the debt for the District of Columbia in 2006 was not available at the time of the analysis.
- 14 Since most plans using the aggregate cost actuarial valuation method do not report any amortization period or percentage of ARC paid, plans using this method are assigned a total amortization period of 30 years, the maximum time specified in GASB 27, a remaining amortization period of one year, and 100 percent of ARC paid. This is due to the fact that the annual contribution is calculated as the difference between the present value of future benefits and assets for this actuarial valuation method.
- 15 The regression was also run using the 2006 debt to GSP percentages for all states and the 2005 debt to GSP percentage for the District of Columbia, which yielded similar results.

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